The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (original) A method of making below 250-nm UV light transmitting optical fluoride lithography crystals, comprising:

placing one or a plurality of selected fluoride crystals in a chamber in an annealing furnace having at least one heating element;

applying heat along a shortest path of conduction of a selected optical fluoride crystal having a birefringence value greater than 3 nm/cm;

heating the optical fluoride crystal to an annealing temperature;

holding the temperature of the optical fluoride crystal at the annealing temperature; and

gradually cooling the optical fluoride crystal to provide a low-birefringence optical fluoride crystal for transmitting below 250-nm UV light, said crystal having a birefringence value less than 3 nm/cm.

2. (original) The method of claim 1, wherein applying heat along the shortest path of conduction of the selected optical fluoride crystal comprises arranging the optical fluoride crystal in selected manner on a surface within said chamber,

wherein said selected manner is

(a) a horizontal (facedown) orientation of the crystal, or

(b) a vertical (edgewise) orientation of the crystal.

3. (currently amended) The method of claim 1 [[~~2(a)~~]], wherein applying heat along the shortest path of conduction of the selected optical fluoride crystal ~~further~~ comprises ~~one of~~:

(a) arranging the optical fluoride crystal on a surface within said chamber such that the orientation of the crystal is horizontal (facedown); and

(b) [[~~(a)~~]] arranging at least one heating element adjacent a face of the optical fluoride crystal, or

(c) [[~~(b)~~]] arranging the optical fluoride crystal between at least one a pair of substantially parallel heating elements.

4. (original) The method of claim 3, wherein one or a plurality of spacers is placed between the optical fluoride crystal and the surface of the horizontal chamber, said spacer(s) being made of an inert material or a fluoride crystal material.

5. (currently amended) The method of claim 1 [[~~2(b)~~]], wherein applying heat along the shortest path of conduction of the optical fluoride crystal ~~further~~ comprises

(a) arranging the optical fluoride crystal on a surface within said chamber such that the orientation of the crystal is a vertical (edgewise); and

(b) arranging the optical fluoride crystal between a pair of substantially parallel heating elements.

6. (original) The method of claim 1, wherein heating the optical fluoride crystal to the annealing temperature further comprises:

(a) increasing an amount of radiation energy applied towards a center of the optical fluoride crystal, or

(b) increasing an amount of radiation energy applied towards a periphery of the optical crystal.

7. (currently amended) The method of claim 1, wherein heating the optical fluoride crystal to an [[~~the~~]] annealing temperature comprises multiple segments of heating and holding the temperature of the optical fluoride crystal.

8. (original) The method of claim 1, wherein a temperature fluctuation around the optical fluoride crystal is controlled to be within about 10°C.

9. (original) The method of claim 1, wherein the optical fluoride crystal is heated in a vacuum atmosphere.

10. (original) The method of claim 1, wherein the optical fluoride crystal is heated in an inert atmosphere.

11. (original) The method of claim 1, wherein heating the optical fluoride crystal to the annealing temperature further comprises exposing the optical fluoride crystal to a fluorinating agent at a predetermined temperature.

12. (original) The method of claim 11, wherein the fluorinating agent is selected from the group consisting of CF_4, NF_3, BF_3, SF_6, C_2F_4, F_2, and mixtures thereof.

13. (original) The method of claim 1, wherein the optical fluoride crystal is selected from the group consisting of CaF_2, BaF_2, SrF_2, MgF_2, LiF and NaF, and mixed metal fluoride crystals made from solid solutions of the foregoing.

14 (original) A method of making one or a plurality of below 250 nm UV light transmitting optical fluoride crystals suitable for lithography, said method comprising:

providing one or a plurality of selected optical fluoride crystals having a birefringence value greater than 3 nm/cm;

placing said crystals in one or a plurality of chambers within a furnace suitable for annealing said crystals;

applying heat along a shortest path of conduction of the selected crystals, wherein said heat is applied to said one or plurality of chambers within said furnace by the operation of one or a plurality of independently controllable heating units within said furnace;

heating the furnace and crystals therein to a first selected temperature and holding said crystals at said first selected temperature for a selected time;

heating the furnace to an annealing temperature and holding said furnace at said annealing temperature for a second selected time, said annealing temperature being below the melting point of the selected crystals; and

cooling the annealed crystals at a selected rate over a selected time period to provide optical fluoride crystals suitable for transmitting below 250 nm UV light, said crystals having a birefringence of less than 3 nm/cm;

wherein said furnace has a plurality of ports for the optional use of temperature probes, gas entry and exit, and the application of vacuum, and

wherein the chamber is unsealed, thereby allowing gas communication between an interior of the chamber and an interior of the furnace.

15. (original) The method of claim 14, wherein the heaters in said furnace are textured to direct heat to either the center of said crystals or the circumference of said crystals.

16. (original) The method of claim 14, wherein a fluorinating agent is admitted to said furnace during said annealing process and said gas is selected from the group consisting of CF_4, NF_3, BF_3, SF_6, C_2F_4, F_2, and mixtures thereof.

17. (withdrawn) An apparatus for making low birefringence optical fluoride crystals, comprising:

a furnace;

one or a plurality of chambers supported inside the furnace for containing at least one optical fluoride crystal, said chambers having a surface for supporting an optical fluoride crystal; and

at least one heater disposed external to the one or plurality of chambers, the heater being arranged to apply heat along a shortest path of conduction of the optical fluoride crystal, and

a plurality of ports in said furnace for the optional use of temperature probes, gas entry and exit, and the application of vacuum;

wherein said chambers are unsealed, thereby allowing gas communication between an interior of the chamber and an interior of the furnace.

18. (withdrawn) The apparatus of claim 17, wherein the optical fluoride crystal in a facedown orientation on the surface within said chamber.

19. (withdrawn) The apparatus of claim 17, wherein the optical fluoride crystal in an edgewise orientation on the surface within said chamber,

20. (withdrawn) The apparatus of claim 17, wherein the heater and/or the chamber is provided with textured surface for enhancing the exchange of radiation between the heater and/or chamber and the crystal.

21. (withdrawn) The method according to claim 20, wherein the heater texture surface comprises a concave shape or a convex shape

22. (withdrawn) The apparatus of claim 20, wherein the chamber textures surface comprises a plurality of depressions on the surface of said chamber adjacent the optical fluoride crystal.

23. (withdrawn) The apparatus of claim 18, further comprising a spacer for preventing direct contact between the optical crystal and a surface of the chamber.

24. (withdrawn) The apparatus of claim 19, wherein the optical crystal is supported in an edgewise orientation within the furnace by an apparatus and a portion of the chamber adjacent a face of the optical crystal has a higher thermal conductivity than a portion of the chamber adjacent an edge of the optical crystal.